MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

DCS5078 – DATABASE SYSTEMS

(For Diploma Students Only)

20 OCTOBER 2016
02:30PM – 04:30PM
(2 Hours)

INSTRUCTIONS TO STUDENT :

1. This question paper consists of **6** pages with **3** sections.
2. Answer **ALL** questions.
3. For **section A** and **B**, shade your answer on the OMR sheet provided.
4. For **section C**, write your answers in the answer booklet provided.

Section A: Multiple Choice Questions (Total: 20 Marks)

Instruction: Please mark your answers on the OMR sheet provided.

1. Which of the following problems associated with storing data in a list is avoided by storing data in a relational database?
   A. Maintaining the data may require changing the same data value in many locations.
   B. Inconsistency when a data item is used multiple times.
   C. Duplication of data items.
   D. All of the above

2. Helping people to search and keep track of things or data is the purpose of a _____.
   A. table
   B. instance
   C. database
   D. relationship

3. What best describes the function of Database Management System?
   A. Collection of interrelated data and set of program to access them.
   B. Database that keep track all the previous information of data.
   C. A system that manage to sort the data according their type.
   D. Collection of raw data.

4. The statement below refers to _____.

   > *"Narrative descriptions of policies, procedures, or principles within an organization."*

   A. company policies
   B. business rules
   C. company manuals
   D. interview report

5. Which of the following **BEST** describes data independence?
   A. Programs are not dependent on the physical and the logical attributes of data.
   B. A collection of file folders, each properly tagged and kept in a filing cabinet.
   C. The changes in file data affects the application program.
   D. Data is defined separately and not included in programs.

6. When the primary key of one relation is placed into a second relation, it is called a _____.
   A. field key
   B. candidate key
   C. super key
   D. foreign key

7. The logical view of the relational database is facilitated by the creation of data relationship based on a logical construct known as a(n) _____ structure composed of rows and columns.
   A. one-dimensional table
   B. two-dimensional table
   C. three-dimensional table
   D. higher level-dimensional table

8. A rule which requires the values of a foreign key to have a matching value in a corresponding primary key is called a _____.
   A. referential integrity constraint
   B. key matching constraint
   C. functional dependency
   D. synchronization

9. Which of the following is **NOT TRUE** about null values?
   A. A null value can mean that the value is known to be blank.
   B. A null value can mean that the value is unknown.
   C. Null values cannot be avoided.
   D. A null value is ambiguous.

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10. Saying that two entities are functionally dependent means that _____.
    A. for one of the entities, if we are given the value of that entity, we can determine the value of one other entity
    B. for both of the entities, if we are given the value of that entity, we can determine the value of one other entity
    C. the functional dependency will have to be removed through normalization
    D. the entities are always connected by a mathematical equation

11. Which of the following is **NOT** part of the implementation process?
    A. Testing.
    B. System analysis.
    C. Evaluating the system.
    D. Creating detailed design specifications.

12. The statement below refers to _____.

> *"That part of a system that defines the extent of the design, according to operational requirements."*

    A. objective
    B. scope
    C. company situation
    D. boundary

13. All of the following are procedure flow in the database design **EXCEPT** _____.
    A. physical design
    B. system design
    C. conceptual design
    D. logical design

14. Changes in hardware, software, documentation, or production to a database system to correct errors, meet new requirements, or improve processing efficiencies are termed _____.
    A. compliance
    B. production
    C. acceptance
    D. maintenance

15. Which of the following is representing the situation when the minimum and maximum number of records of a class is one?
    A. Mandatory one
    B. Optional one
    C. Mandatory many
    D. Cannot tell

16. Which of the following is a characteristic of **GOOD** identifier?
    A. One that is unique
    B. Can be null
    C. One that can change over time
    D. Be intelligent

17. Which of the following is the term for assigning permissions to a validated user?
    A. Authentication
    B. Procedure
    C. Authorization
    D. Role

18. Which of the following is the **BEST** definition of a policy?
    A. A set of related permissions
    B. A set of rules for doing things
    C. Ownership of database objects
    D. Step by step instructions for accomplishing a task

19. Within a corporate information services department, the task of creating the physical database and its logical relations are responsibilities of the _____ function.
    A. database administration
    B. server administration
    C. data administration
    D. data modeling

Continued...

20. Which type of data dictionary is composed of metadata that is created automatically as the system components are created?
    A. Passive
    B. Dynamic
    C. Active
    D. Automatic

Section B: True / False (Total: 20 Marks)

Instruction: Please mark A for True statements and B for False statements in the OMR sheet provided.

21. In a database, rows and columns are needed to store the data in the spreadsheets.
22. Duplication of data items in multiple files is normally known as data redundancy and can lead to data anomalies once the data have been updated or deleted.
23. The principal advantage of database systems is the ability to share the same data across multiple applications and systems.
24. Most organizations build several databases leading to significant and uncontrolled redundancy between databases.
25. Information systems that store groups of records in separate files are called file processing systems.
26. Given the functional dependency A → (B, C), A is a determinant.
27. In a database, primary key fields may be duplicated across records.
28. A characteristic of a relation is that the cells of the relation hold a single value.
29. A relation can have only one candidate key.
30. The columns of a relation are sometimes called "tuples."
31. Three phases of database design are conceptual database design, logical database design, and physical database design.
32. The classic systems analysis methodology is called the Analysis Development Life Cycle (ADLC).
33. Database implementation involves using database software to implement the database model as an actual database.
34. Full back-up is a complete copy of the entire database saved and periodically updated in a separate memory location.
35. The multiplicity at the target class end of an association is the number of records that can be associated with a number record of source class.
36. Properties that describe the characteristics of classes are called attributes.
37. The database administrator is responsible for managing changes to the database structure, but is rarely involved in the original design of the structure.
38. Information that is collected in database systems can be used, in general, for two purposes: an operational purpose and a transactional purpose.
39. At the level of top management, the database must be able to deliver the data necessary for tactical decisions and planning.
40. The database administrator is responsible for database design, if both data and database administration exist in an organization.

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Section C: Structured Questions (Total: 60 Marks)

Instruction: Please write all your answers in the Answer Booklet provided.

QUESTION 1

Based on the following situation, draw a complete Entity Relationship Diagram using the **Crow's Foot** notation which includes:

(i) All entities and attributes (12 Marks)
(ii) Relationships (1.5 Marks)
(iii) Connectivity and participation constraint (3.25 Marks)
(iv) Primary and foreign keys (3.25 Marks)

Elena, the owner of Exotic Flower, Inc., built a greenhouse to store several types of exotic flowers that she purchases from wholesale suppliers around the world. Each exotic flower Elena buys and resells falls into one of several flower groups. Each flower has a unique identification and details such as its scientific name, description and price are stored.

The exotic flowers are purchase from wholesale suppliers. Each exotic flower is purchased from many wholesale suppliers and each wholesale supplier delivers many exotic flowers to Elena's shop. Each supplier will have a unique supplier code, name and contact number. The delivery date of the exotic flower is stored as well.

These exotic flowers are purchased by a customer but not all flowers are going to be sold to a customer. The exotic flowers will be arranged as bouquet for shop display. The customers are identified by its unique number. The customer information such as name, address and telephone number is also kept. A customer may purchase more than one exotic flowers per transaction. Each exotic flower can be purchased by many customers on a different date. Details of each order are stored such as quantity and expected delivery date.

Exotic flowers are required to be keep in greenhouses. The greenhouses are identified by its unique number. The greenhouse information such as temperature is also kept. Each exotic flower is kept in one greenhouse but one greenhouse can be used to keep in many exotic flowers. It is not compulsory for an exotic flower to be keep at any greenhouses at all.

[Total: 20 Marks]

QUESTION 2

Product Table

ProductKey	ProductName	ProductUnitSize	ProductPrice
Top	Additional Toppings	1 cup	1.00
SpecialS	Specialty Small	8 inch	6.35
SpecialM	Specialty Medium	12 inch	9.25
SpecialL	Specialty Large	18 inch	15.00
soda	Soda Bottle	2 liter bottle	3.75
brdstks	Breadsticks	8 per pack	2.50
basicS	Basic Pizza Small	8 inch	5.35
basicM	Basic Pizza Medium	12 inch	7.35
basicL	Basic Pizza Large	18 inch	13.50

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`Order Detail` Table

OrderDetailKey	OrderKey	ProductKey	OrderDetailQuantity	OrderDetailPriceCharged
1	1000	Soda	2	7.25
10	1005	basicM	2	14.70
2	1000	brdstks	1	2.50
3	1000	SpecialM	1	7.35
4	1001	SpecialL	1	15.00
5	1002	Soda	2	7.25
6	1002	basicM	3	20.00
7	1003	basicM	1	7.35
8	1003	Top	4	4.00
9	1004	basicL	1	13.50

Write the SQL commands based on the tables given above.

(i) List all the order detail with charged price between RM10 and RM20 for product key end with '***m***'. Use ***Between***. (3 Marks)

(ii) Display product name, product price and product price after 15% discount for product price more than RM10. (2.5 Marks)

(iii) Display the total due for each order for total due less than RM20. (3.5 Marks)

OrderKey	Total Due
1003	11.35
1004	13.50
1005	14.70

(iv) Add another column called ProductDesc in table Product after product name column. The content of this column must not be NULL. Set the attribute to the best data type and length. (2 Marks)

(v) Add a new pizza order detail for order key 1006. You are free to use your own values for the rest of the order detail attributes except for order key. (2 Marks)

(vi) Display the total number of order quantity for each product for product name start with '***s***'. (4 Marks)

ProductName	Total Quantity Ordered
Soda Bottle	4
Specialty Large	1
Specialty Medium	1

(vii) Display the product details with the price more than average price and display as shown below. Sort according to product price from the expensive to cheapest price. (3 Marks)

ProductKey	ProductName	ProdDesc	ProductUnitSize	ProductPrice
basicM	Basic Pizza Medium		12 inch	7.35
SpecialM	Specialty Medium		12 inch	9.25
basicL	Basic Pizza Large		18 inch	13.50
SpecialL	Specialty Large		18 inch	15.00

[Total: 20 Marks]

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QUESTION 3

Computer Software Table

Computer Number	Computer Type	Computer CPU	Software Number	Software Title	Software Version	Software Company
6321	Desktop	Core™ i7-6785R Processor	1005	FileZilla	5	FileZilla
			1001	Windows 7	Service Park 1	Microsoft
			1002	MS Office	2013	Microsoft
8520	Laptop	Core™ i7-6700 Processor	1003	Visual Studio	Professional 2013	Microsoft
			1001	Windows 7	Service Park 1	Microsoft
			1005	FileZilla	5	FileZilla
3657	Notebook	Core™ i7-6600U Processor	1002	MS Office	2013	Microsoft
			1004	Photoshop	CS6	Adobe
2014	Desktop	Core™ i7-6785R Processor	1003	Visual Studio	Professional 2013	Microsoft
			1004	Photoshop	CS6	Adobe

License Key	License Type	Start Date	End Date	Licence Price	License Pricing Unit	Installation Date
41640	Open Source	01-Jul-09	01-Jul-20	0	0	11-Oct-15
41760	MS Site	07-Jan-15	07-Jan-20	25000	5 years	09-Sep-15
41760	MS Site	07-Jan-15	07-Jan-20	25000	5 years	09-Sep-15
41673	MS Instructional	07-Jan-13	01-Jul-29	3000	5 years	22-Aug-15
41760	MS Site	07-Jan-15	07-Jan-20	25000	5 years	08-Mar-14
41640	Open Source	01-Jul-09	01-Jul-20	0	0	11-Oct-15
41760	MS Site	07-Jan-15	07-Jan-20	25000	5 years	23-Oct-15
41741	Adobe1	01-Jul-15	01-Jul-17	450	per active copy	23-Oct-15
41673	MS Instructional	07-Jan-13	01-Jul-29	3000	5 years	06-Dec-15
41741	Adobe1	01-Jul-15	01-Jul-17	450	per active copy	03-Mar-16

Note: The report above is actually one table but split into two to fit to this A4 paper.

(i) Using the `Computer Software` table structure shown above, draw the complete dependency diagram for the **1NF**. Make sure you label the transitive and/or partial dependencies. [9.5 Marks]

(ii) Using the initial dependency diagram drawn in (i), normalize the table into **2NF** and **3NF** by using relational schema. [10.5 Mark]

[Total: 20 Marks]

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